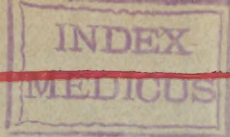


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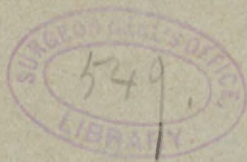
Electricity in the Treatment of Exophthalmic Goitre.

Read in the Section on Neurology and Medical Jurisprudence, at the
Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

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ELECTRICITY IN THE TREATMENT OF EXOPHTHALMIC GOITRE.

BY ROBERT NEWMAN, M.D.

Much has been written on Basedow's disease or Graves, as exophthalmic goitre is often called. Notwithstanding the large amount of literature on the subject since 1835, its etiology and pathology is not definitely understood or settled. Most authors believe that it is a disease of the sympathetic system, having its origin in the cervical branch. Treatment therefore has been more empirical and unsatisfactory. The conclusion is, that exophthalmic goitre ends generally in death, usually caused by complications, of which a general nervous exhaustion and marasmus are prominent. Recovery, however, may occur, even without treatment.

While we have on record, reports of cures, the treatment by therapeutic means has not been satisfactory. It is conceded that some remedies, like iron and digitalis, have allayed symptoms, but they scarcely cured the disease. The ground of therapeutics is so well covered in reports that this paper will not touch on it and will only consider the treatment by electricity, which has promised to do more than medicines. Successes have been reported by different authors who have given applications in different ways, but most agree that galvanism is the proper selection to be used in the disease under consideration.

Galvanization has been used by v. Dusch, who, in one case, after many séances, succeeded in lowering the pulse from 130 to 70, and reduced somewhat the exophthalmus.



Eulenburg galvanized the cervical sympathicus with similar results in 1867, using the negative pole. He also used galvano-puncture without any appreciable result.

M. Meyer¹ reported four cases and Chvostek,² who is a pioneer in the observation of this disease, has given much labor, and reports thirteen cases with galvanism in the same manner. These observers report improvements in all cases in which they used galvanism, but do not pronounce decided cures.

A. D. Rockwell³ has treated cases in a similar manner with galvanism to the sympathicus. He applied the negative pole over the cilio-spinal center above the seventh cervical vertebra, and the positive in the auriculo-maxillary fossa, gradually drawing the positive along the inner border of the sterno-cleido mastoid to its lower extremity. The second step consists of removing the positive pole to the position occupied by the negative, and placing the latter over the solar plexus, using for a minute a greatly increased strength of current.

Galvanization of the sympathicus has also been practiced by Neftel.

Eichorst uses the negative pole high up in the neck and the positive pole between the scapulæ, a current of five to ten cells for two minutes. Then he applies the positive pole upon the cervical spine, the negative over the sympathetic and pneumogastric upon each side for two minutes, from auriculo-maxillary fossa down the inner edge of the sterno-cleido mastoid to the clavicle.

As the affection probably begins in the medulla, currents have been passed through the back of the head above the spine. Transverse currents have been passed through the goitre. Several friends tell me they have reduced the size of the goitre by plac-

¹ M. Meyer: Berl. Medic-Gesellsch, 1871-73.

² T. Chvostek: Wien Med. Presse, 1869-1875.

³ A. D. Rockwell: The electric treatment of exophthalmic goitre. Trans. AMER. MED. ASSOC. Philadelphia, 1880, XXXI, 177.

ing both poles near the thyroid, but it is evident they ignored other symptoms of the disease.

Erb has tried very mild currents to the eyes with an uncertainty of benefit.

Ziemssen recommends strong galvanic currents, and at the same time contradicts his own advice by urging caution in their use.

Hunter McGuire uses the following galvanic application: Positive cup-shaped electrode containing iodine on cotton over the gland, and the negative pole on the back of the neck.

Frank D. Boyd,⁴ of San Antonio, Texas, reports improvement of one case in which he used very judicious treatment of therapeutics and daily galvanic application, but does not state how the galvanism was applied.

There are reports from Vizioli⁵ in 1878.

Needles in goitre by electro-puncture have been used by Duncan,⁶ of Edinburgh, and others with unsatisfactory results. It seems that all surgical applications of electricity as galvano-cautery, electrolysis, cataphoresis, as well as electro-puncture, have given no beneficial or curative results. Even the cataphoresis of Adamkiewicz, an electric anesthetic by diffusion, has given slight and very temporary relief of neuralgia.

From these reports it seems that all operators gave particular attention to the sympathetic nerves, but differed in the selection of the poles to certain regions and the way of application. Some placed the positive pole to a region where others used the negative pole. Some applied the galvanism with the apparent intention to allay only one symptom of the disease, while there are several symptoms to be looked after.

The writer has treated within the last two years

⁴ Frank D. Boyd: Report of a case of exophthalmic goitre, Medical Record, N. Y., March 30, 1895.

⁵ Vizioli: *Elettoterapia pratica* Morgagni, Germajo, p. 69, 1878.

⁶ Duncan: Brit. Medic. Jour., Nov. 3, 1888, p. 986.

three cases of Basedow's disease with apparent good results, which can be called *cured*. All three patients were females.

The first case was a very aggravated one, who was ten years under electric treatment by one of the best authorities and practitioners in electricity. During those years, in which the life of the patient was despaired of, slow progress was made under very careful and judicious treatment. After the treatment had been suspended during a sojourn in the country, symptoms grew worse, and then in the fall of 1893 the patient came under the writer's care. It needed one year's treatment before the patient declared herself well, and she has remained so up to date.

A detailed history of this case is annexed here, from notes and observations by the writer's assistant, as follows:

Case 1.—W. C., age 40, single. She had been under treatment for nearly ten years with an authority in electricity and nervous diseases. During that time she improved considerably, but was not cured. An interruption of treatment was due to a sojourn in the mountains; during which time a relapse took place. In November, 1893, she came under Dr. Newman's care. She then had all the symptoms of exophthalmic goitre; was very anemic, nervous system was unstrung; a great uneasiness, a general nervous prostration, insomnia, sometimes nausea, anxiety, bowels disordered, with dyspeptic symptoms and all symptoms of neurasthenia. The heart action was irregular, pulse varying between 120 to 150, temperature 100. Emaciation prevailed with scarcely any appetite. The thyroid gland was enlarged—the circumference of the neck being thirteen and one-sixteenth inches. The eyes protruded very much, which gave the expression of anxiety to her face. The case was very aggravated, so that her relations were alarmed about her life. Her family history is good, but her father had heart trouble and her mother, who is still alive, has always had symptoms of dyspepsia.

The treatment consisted of galvanism in various ways, three or four times a week. In order to cause an absorption of the new tissue formed behind the eyeball, a medical electrolysis was used. For the negative pole, a solution of chlorid of sodium was applied directly to the eyes, while the positive sponge electrode was held in the hand. Only a very weak current was borne and the electrolysis was caused by

the solution—like an eye-bath through which the negative pole acted—as an absorbent. To the enlarged thyroid gland the negative pole was also applied in the form of a sponge pad, and in this the result expected was the diminishing of the size of the goitre by the chemic action of electrolysis. The application to the nervous system, in which the sympathetic was included, was varied according to indications and the solar plexus received its share of attention. One of the applications consisted of a helmet to the head, while the other pole was placed over the solar plexus. This helmet was made of strips of German silver fastened to a circle, which corresponded to the circumference of the head. To have an even action to the head the hair was wet with water, and a wet felt cap placed between the head and the helmet. The result of this treatment was satisfactory in every respect and all symptoms of the disease improved.

May 1, 1894. Improvement in every respect. Patient felt more rested, the unpleasant nervous excitement was calmed, and sleep procured. Heart had a more steady action; pulse was reduced and the measurement around the neck was twelve and seven-sixteenths inches in circumference, five-eighths of an inch reduction. Patient left in July, 1894, for a sojourn in the mountains, which interrupted the treatment, *pro tem*. Sept. 6, 1894. Slight relapse has occurred while being without treatment. The thyroid gland has increased, and the measurement is twelve and five-eighths inches around the neck. September 20. Treatment in the same manner as before, with galvanism, has made rapid improvement. Heart is more regular; pulse is reduced; eyes still prominent. October 2. Thyroid gland is reduced so that the circumference of the neck measured twelve and one-half inches. November 30. Thyroid still lessened—measurement twelve and seven-sixteenths inches. Treatment continued; no medicine given, only galvanic applications. March 22, 1895. Neck's circumference normal size—twelve and three-eighths inches—the patient when in perfect health wears a twelve and one-half inch collar. The eyes have resumed a natural look, without having any protuberance. Heart's action is normal; pulse 76; temperature 98.5; all nervous symptoms subsided; good natural sleep procured. Patient considers herself well; takes part in all the pleasures of life and enjoys all in an active way.

Case 2.—Had many symptoms like the first, but was not as aggravated. The treatment was similar and has been pursued for nine months. The patient, a female, 30 years old, has improved so much that a cure may be pronounced, but is still under observation with galvanic applications at irregular intervals.

Case 3.—The third patient was a young lady who sang a principal part in an opera company. A question arises here

if heredity has an influence, as her mother died of Basedow's disease. This patient had an exophthalmic goitre which was correctly diagnosticated, and different physicians treated her with medicines for over two years, during which time she grew gradually worse, until at last, at a performance after reëntering the wings, she fell prostrated and unconscious, ending her operatic career for a time. The patient came under the writer's treatment in December, 1894. The electrical treatment was carefully but vigorously pursued; on an average, five séances per week were held. In less than four months this very aggravated case was entirely cured. All symptoms have disappeared, the constitution improved, weight increased, and features restored. Patient considers herself well and is ready to enter another opera company. (Since the above has been written, patient has appeared on the stage, and feels very well.)

In this case were complications of severe oöphoritis and endocervicitis. There was hemorrhage from the uterine cavity which increased on the slightest touch, and also a profuse mucous discharge. The region of the ovary, in fact, the whole hypogastrium was painful, and the sensitiveness was increased on any pressure. These uterine troubles have been treated locally at intervals. The only therapeutic agent given this patient has been peptonate of iron to improve the quality of her blood on account of the anemic state, which was very marked. The iron was given when the nervous symptoms were improved, and then it acted well.

The electric treatment of this case consisted of galvanism, given in different ways and places. The galvanic treatment was assisted by the spray of the static machine. The spray was given twice a week very cautiously over the spine, head and over the sensitive parts of the ovaries with very good effect.

The history of this case has been written up by the patient herself, in which is embodied notes about her mother, who died of Basedow's disease. The interest is in the question of heredity. The diagnosis in both cases of mother and daughter had been made by several eminent physicians with an unfavorable prognosis. These notes are here annexed:

History of the Third Case: The patient, Z. R., writes as follows:

NEW YORK, April 6, 1895.

At the age of 16 I had just returned from Europe, it being a pleasure trip only. After being home but a short time I was taken seriously ill. The palpitation of my heart troubled me dreadfully, and occasionally a spasmodic pain of the heart which was severe while it lasted. My feet began to swell and I was so prostrated, physically, that it was impossible to go the shortest distance without great exertion and fatigue. Dr. Loomis, the great authority on lung and heart diseases, pronounced me incurable and warned my mother not to allow me to go anywhere without an escort, as I was liable to drop dead at any moment. My mother shortly afterward was advised to put me under the care of Dr. Louis Conrad. He said I had a defect in the heart which was incurable, but if I took care of myself and led a quiet life that it would not bother me. He also informed my mother that I was subject to a disease called "chlorosis," or "poverty of the blood." Nevertheless, under his treatment I survived, not being very strong at any time—naturally delicate. About three years later my mother, having enjoyed good health up to the date making her forty-eighth year, began to complain; being of a bright, strong temperament and was subject to very severe, nervous headaches.

I wish to say that she was a great business woman, having as many as 300 hands under her employ at one time, which made a great deal of brain work for her, but at the time of which I speak, from that period, she seemed to fail gradually. She grew more excitable, easily fatigued, excessively nervous, gave way to temper at the slightest provocation, which would terminate in a severe nervous headache, and the only cure was perfect quiet in her room in complete darkness. A year later, she complained of increased fatigue, but I presume the Basedow's disease was gaining more hold on her system. Her heart beat so tumultuously that she felt the pulsation in her throat, but her neck did not increase very much in circumference. The inflammation of the eyelids and bulging of the eyeballs—this last being made more prominent by a staring expression. Her knees gave way, but being of a determined disposition she would not go to bed.

Shortly afterward, I went away on business. My mother became annoyed at a servant, gave way to a fit of temper, and the excitement was too much for her. She fainted, and from that day to the day of her death was confined to her bed. As she had previously used up her strength worrying about domestic affairs, business was a thing of the past.

From that time her heart beat faster and more irregular;

marked pulsation was felt in the throat, ends of fingers, in fact, all over her body. Under the optician's examination there was found a pulsation in the eye. She had a hacking cough, at times violent, especially after eating, which would make it almost impossible for her to keep any food on her stomach, but that did not surprise me as each doctor would give her a new dose of medicine, and between the various ones and the medicine that would be given after each consultation, I do not wonder at her digestion being ruined.

Mother suffered all her life with constipation, the treatment of which she neglected. The doctors gave her some medicine which made her bowels so loose that it made her very weak. Three weeks before she died I had to take her to a hospital, one of the best in the city. The doctors there gave her champagne, and it made her delirious. After one of the delirious attacks she was put to bed by four doctors. They told me she asked after me, required my presence, turned over and died. She was 50 years old.

I was sleeping, and as I was exhausted with the care and worry about her; I was not called until too late. She died of exhaustion and with a pulse of 180. I have always had a doubt in my mind as to her death being easy—I suppose the doctors wanted to spare my feelings, but the truth would have been preferable. I nursed and attended her through her entire sickness—the serious period being about seven months. During the above period she lost flesh rapidly and was very much emaciated.

A few months after my mother's death I was married. My married life was a failure from a domestic and physical standpoint. My husband abused me, which run my health down dreadfully, and combined with the shock of my mother's death, which I will never survive, I became a bunch of nerves.

I have been doctoring for two and a half years and no relief. In June I shall have been married three years, and will be 25 years old the 30th of next October.

The doctors have not helped me one particle. All they did was to fill me with opiates and chloral which almost killed me—in fact, I was in a state of complete collapse. Four months ago I called in Dr. Newman—having all the symptoms of Basedow's disease previously mentioned: nervousness, sleeplessness, melancholia, loss of appetite, irregular action of the heart, very excitable irritable temper, general fatigue at the slightest exercise, a feeling of numbness in the limbs, swollen feet and puffing out of the flesh in which the finger could make an impresion. After four months of galvanic electricity, I feel better than I have for years and consider myself well enough to discontinue treatment. Occasional application from the static machine often relieved me of a nervous headache; in fact, relieved a pain

in the spinal column which was for a period continuous and very painful.

REPORTS OF CASES.

On record are reports of cures by medicines, electricity, both combined, and even spontaneous cures. These results, however, are exceptions, and the rule in the treatment of exophthalmic goitre is that they are failures, often ending in death. It is also conceded by most authors that electricity, in this disease, gives better results than medicines. This, however, does not prove that electricity in any form, and even given by specialists, always cures.

There are failures and unsatisfactory results reported. The writer has made diligent inquiries among reliable specialists in electricity and been told of cures, benefits, as also of indifferent and unsatisfactory results and even failures. Such results must be expected, as the *modus operandi* of electricity has been conducted differently by the operators, and it seems even on entirely opposite plans.

TREATMENT.

Electrical specialists in the treatment of exophthalmic goitre have mostly given galvanism to the sympathetic, and in this they all agree. They differ, however, in the selection of the poles, the direction of the current, the size of the electrodes, the duration of the séance and the intervals.

It seems, further, a mistake to treat solely the sympathetic system and to overlook other important points of this disease. Most European authorities give the electric applications too short, being from one to two minutes' duration, while in America such séances are prolonged to about twenty minutes, which tires the patient and gives too great stimulation. The question arises, if it would not give better results to arrange the electric applications more rationally to symptoms and complications, as with our present knowledge neither etiology nor pathology of this disease is settled.

PROMINENT SYMPTOMS.

Beside complications and natural consequences, exophthalmic goitre has three prominent symptoms to which the treatment should be directed. These are:

(a.) Irregular heart action with all kinds of nervous symptoms.

(b.) Enlargement of the thyroid gland.

(c.) Protrusion of the eyeballs.

Complications are anemia, emaciation, insomnia, uterine diseases, irritability, edema, fainting spells, etc.

The Indications for Treatment are: (a), to reduce the pulse, regulate the heart action, produce rest and sleep and allay the nervous symptoms. Beside the sympathetic system it is necessary to regulate and treat the pneumogastric and vagus; (b), to diminish the size of the thyroid gland; (c), to remove the plastic new formations behind the eyeballs.

The Treatment, therefore, would be:

1. Galvanism to the sympathicus, vagus and pneumogastric, in such form as to reduce the pulse and stimulate the heart's action. In other diseases, galvanism quiets to such a degree that patients fall asleep while the application is given.

The Strength of the Current must be regulated according to the toleration of the patient in every case. The operator must exercise great care in slowly increasing the electro-motive force of the current, till the exact amperage is found, and every step of increase and decrease must be made with care and without any accidental shake or jerks of the current. The exact measure in milliamperes can not be advised and depends entirely on the sensation in each individual case. Some patients may be so irritable that even 2 milliamperes may be too much, while others can endure 20 or even 30. It is also essential to regulate the strength of the current in the same patient according to the region to be galvanized, to the size of the electrodes and the resistance between the two poles.

The *Static Electricity* will assist to regulate the vascular circulation, allay nervous irritation, creating a sedative to the heart and a more refreshing sleep.

2. The thyroid gland will be reduced with almost a certainty by the negative pole of the galvanic battery. Some report good results by applying both poles near the gland, one on each side. While this may have result the method is harsh and not rational. Surgical means have not been successful.

3. The protrusion of the eyeballs can only be cured by diminishing the new formations of tissues, grown behind the eyeballs, by which the eyes have been pushed forward. This can be done by the use of the negative pole to the eyes, which acts like an electrolysis absorbing the foreign tissues. The complications have to be treated according to indications.

The static electricity is here recommended only as an assistant and must be given with care. Sparks are contra-indicated, as they are too severe and will create often more nervousness and even pain. Breeze or spray will act well, allaying pain and regulating the circulation.

There Should be Avoided: Too strong currents, too long séances, which tire the patient and over-stimulate internal electrolysis, and surgical electricity. The faradic current has been used and recommended, given with certain precautions, but it seems it is contra-indicated, as a severe measure, which over-stimulates and disturbs more the diseased nerves.

With regard to general rules, avoid also excitement, over-exertion, stimulants, strong tea and coffee. It is evident that the treatment, and especially the application of the electricity, must be intrusted to an expert, and that the family battery for self-use (or abuse) is entirely out of the question.

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